

# **State of New Hampshire**

GENERAL COURT  
CONCORD

## **MEMORANDUM**

**DATE:** November 21, 2007

**TO:** Honorable John H. Lynch, Governor  
Honorable Terie Norelli, Speaker of the House  
Honorable Sylvia B. Larsen, President of the Senate  
Honorable Karen O. Wadsworth, House Clerk  
Tammy L. Wright, Senate Clerk  
Michael York, State Librarian

**FROM** Rep. James F. Powers, Chairman

**SUBJECT:** Final Report on HB 1491, Chapter Law 309:3, Laws of 2006

Pursuant to Chapter 309:3, Laws of 2006, enclosed please find the Final Report of the Commission to Study the Publicly Owned Treatment Plants Needs of NH and State Laboratory Water Tests and Fees for Such Tests Collected by the Department of Environmental Services.

If you have any questions or comments regarding this report, please do not hesitate to contact me.

JFP:dm  
Enclosures

cc: Commission Members  
Joel Anderson Committee Researcher

TDD Access: Relay N H 1-800-735-2964

# **Report of the Commission to Study the Publicly Owned Treatment Plants Needs of New Hampshire and State Laboratory Water Tests and Fees**

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# **Report of the Commission to Study the Publicly Owned Treatment Plants Needs of New Hampshire and State Laboratory Water Tests and Fees**

## **Executive Summary**

New Hampshire House Bill 1491, Chapter 309, Laws of 2006, established a Commission to “study the publicly owned treatment plant needs of New Hampshire and state laboratory water tests and fees”. The Commission met seven (7) times between August 2006 and October 2007. This report, approved at the Commission’s November 7, 2007, meeting, represents the final report of the Commission.

Based on analyses of available data and records, the Commission estimates that upgrades to New Hampshire’s wastewater treatment facilities (WWTFs) to meet the needs imposed by growth and increasingly stringent treatment standards will cost approximately one billion dollars (\$1,000,000,000) over the next ten years.

The Commission studied the current status of the State’s wastewater treatment plant infrastructure. There are currently 85 publicly-owned treatment works (POTWs) and 27 private WWTF’s serving an estimated population of 1.3 million NH citizens. Wastewater generated by most NH residents and a significant number of industries discharge directly to WWTFs. The remaining residents rely on septic systems that produce residues (i.e. septage) that must be periodically collected and disposed of at WWTFs. The population of New Hampshire is increasing at an annual rate of 5.6%, the highest rate in New England and greater than the average rate of growth for the entire US. This growth increases impacts on all aspects of wastewater infrastructure and disposal issues.

The US Environmental Protection Agency has embarked on a program of setting increasingly more stringent discharge limits for WWTFs to enhance receiving water quality. Municipalities may have to implement new and emerging technologies, such as membrane bioreactors, in order to meet more stringent wastewater treatment requirements. These technologies promise increased treatment efficiency and higher effluent quality, some requiring less energy consumption, but will also require substantial capital investments to implement.

An October, 2007, study released by *Environment New Hampshire* (visit <http://www.environmentnewhampshire.org/reports/clean-water/clean-water-program-reports/troubled-waters-an-analysis-of-2005-clean-water-act-compliance>) lists New Hampshire

as “one of ten states with the highest percentage of major WWTFs exceeding their Clean Water Act permit limits at least once”, based on 2005 compliance data. While many of the exceedances listed in Appendix B of the *Environment New Hampshire* report appear to reflect statistically minor variations in effluent quality, the study’s findings may be viewed as a reminder that New Hampshire must focus more effort on maintaining and upgrading aging WWTFs.

The New Hampshire Department of Environmental Services (NHDES) completes a statewide wastewater treatment facility needs assessment every four years. The 2004 needs assessment, the latest completed by NHDES, indicated that the cost to perform necessary upgrades to facilities statewide is \$673,700,000. This estimate is expected to grow substantially, due to factors such as inflation and more stringent discharge requirements, when the 2008 needs survey is finalized next year. Many of New Hampshire’s WWTFs were constructed in the 1970s and 1980s under the Federal Construction Grants Program., which provided funds for such construction in the ratio of 75% Federal, 20% State, and 5% Local. (See attached **Figure 1**.) These facilities are now reaching or surpassing their designed lifespan and will need expensive rebuilding. The Federal Construction Grants Program was curtailed in 1989.

The Commission finds that, on a statewide basis, an annual investment of \$105 million for WWTF upgrades will be needed over the next ten years. The majority of these costs will have to be raised through sewer use fees as current Federal and State grant and loan programs have leveled off at approximately \$22 +/- million per year. (See **Figures 2 and 3**.) User fees are often regarded as another form of tax collected by municipalities. Municipal officials strive to control these costs and may choose to defer plant maintenance and upgrade projects until large investments can no longer be delayed, because of Federal permit discharge violations and impending administrative fines and civil actions. The Commission recognizes that continuous and incremental investments in WWTF infrastructure through preventive maintenance and programmed upgrades are preferable to large-scale facility overhauls. Additionally, this appears to be the most cost effective approach over the long term. Based on the forecasted cost of the necessary WWTF upgrades, the Commission is seeking enhancements to the federally-backed New Hampshire State Revolving Fund (SRF) program as the most appropriate strategy to address this emerging funding crisis.

Required WWTF upgrades must be addressed on a case-by-case basis due to site-specific influent wastewater characteristics, and treatment and discharge requirements based upon receiving water considerations and water quality goals. Inter-municipal cooperation is currently authorized by RSA 149-I: 4 and the Commission encourages municipalities to explore options for sharing the burdens and benefits of WWTF upgrades based on the principle of economy of scale. The Commission also recognizes that the NHDES plays a critical role in the direction and oversight of investments for WWTF upgrades. The Commission requests assistance from the General Court and the Governor to assure that NHDES has adequate resources to manage New Hampshire’s WWTF upgrades and to conduct additional outreach to municipalities to encourage preventive maintenance and programmed upgrades.

The Commission recognizes that sludge management and septage disposal are concurrent issues under evaluation by a study commission created by House Bill 699 in 2007. Stormwater management is also an emerging regulatory issue with relevance to wastewater treatment

facilities, particularly for municipalities facing combined sewer separation projects. Several proposals for stormwater legislation will be considered in the 2008 session of the General Court.

Regarding state laboratory water tests and fees, House Bill 2 of 2007, set a new schedule of analytical services and their fees offered by the NHDES Laboratory. The Commission recognizes that the Department is actively reviewing test offerings, calculating the actual costs for tests, and when their current study is completed, will seek future legislation to make appropriate changes.

## **Commission Recommendations**

- The Commission urges the NH General Court and Executive Branch, and the US Congressional Delegation to actively seek an increase in Federal funding for wastewater treatment facility improvements. The Commission suggests a cost-sharing plan with costs apportioned to 50% Federal, 40% State, and 10% Local, consistent with grant programs available during the 1960s prior to the passage of the Federal Clean Water Act.
- The Commission urges the NH General Court and Executive Branch to increase both the State Revolving Fund (SRF) and State Aid Wastewater grant programs to keep pace with inflation (reference Figures 2 and 3).
- The Commission recognizes that in 2008 the NHDES will revise its statewide wastewater treatment facilities needs assessment. The Commission requests that this assessment include a coordinated plan to prioritize allocation of resources where they will provide the most benefit to correcting water quality impairments due to NPDES discharges.
- The Commission requests assistance from the General Court and Executive Branch to assure that NHDES has adequate resources to manage NH's WWTF upgrades and to conduct outreach to municipalities encouraging preventive maintenance and programmed upgrades as an alternative to major facility overhauls. The activities of the NHDES Wastewater Bureau should be focused on encouraging WWTFs statewide to adopt Best Management Practices for treatment process quality control and continuous performance improvement.

Figure 1

**EPA CONSTRUCTION GRANT ALLOTMENTS TO NH  
FOR SEWER/WASTEWATER TREATMENT PROJECTS  
FEDERAL FISCAL YEARS 1973 THROUGH 1990**



Millions of Dollars

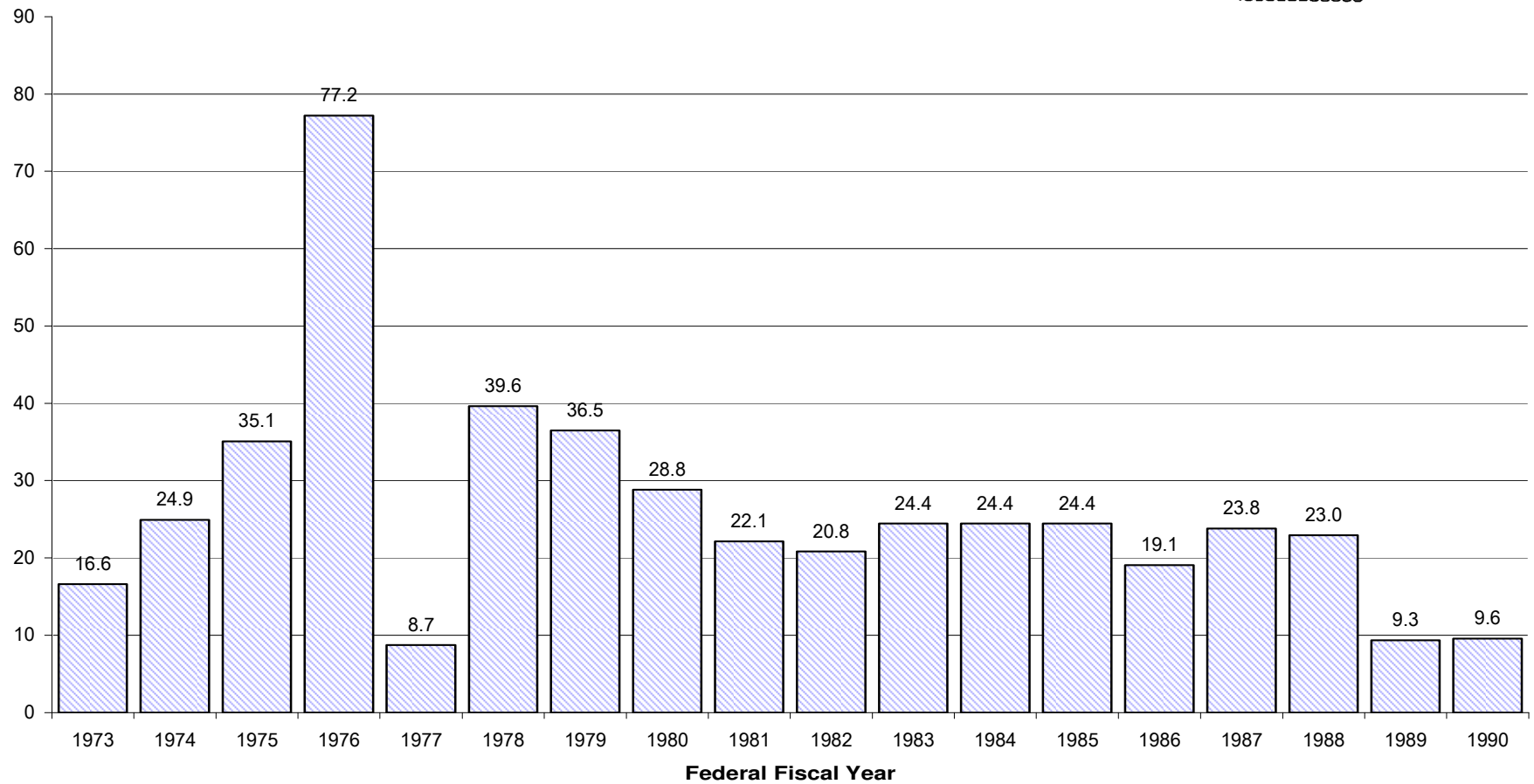


Figure 2

**GRANT PAYMENTS TO MUNICIPALITIES BY DES  
FOR SEWER/WASTEWATER TREATMENT PROJECTS  
STATE FISCAL YEARS 1973 THROUGH 2007**



Millions of Dollars

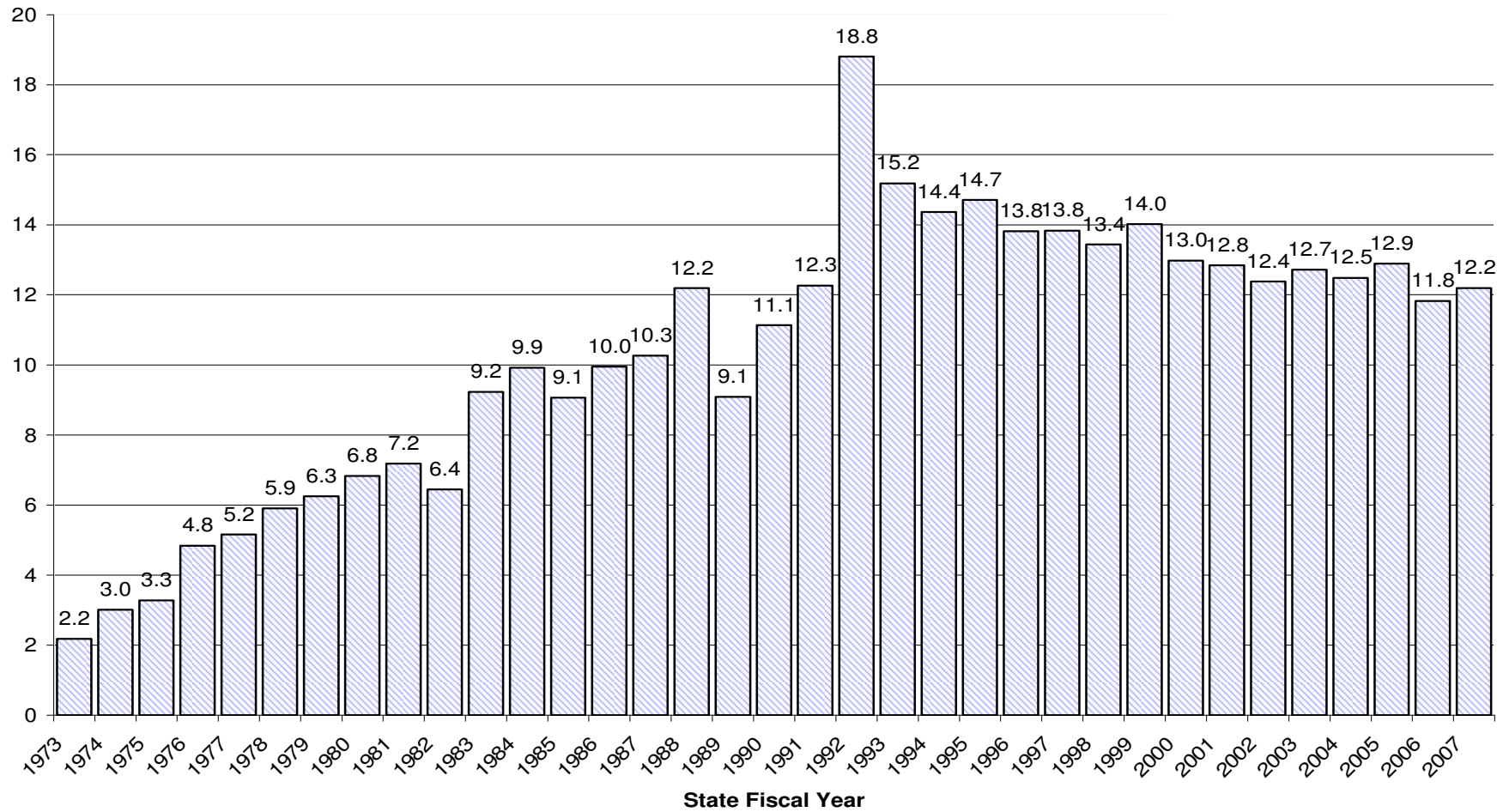
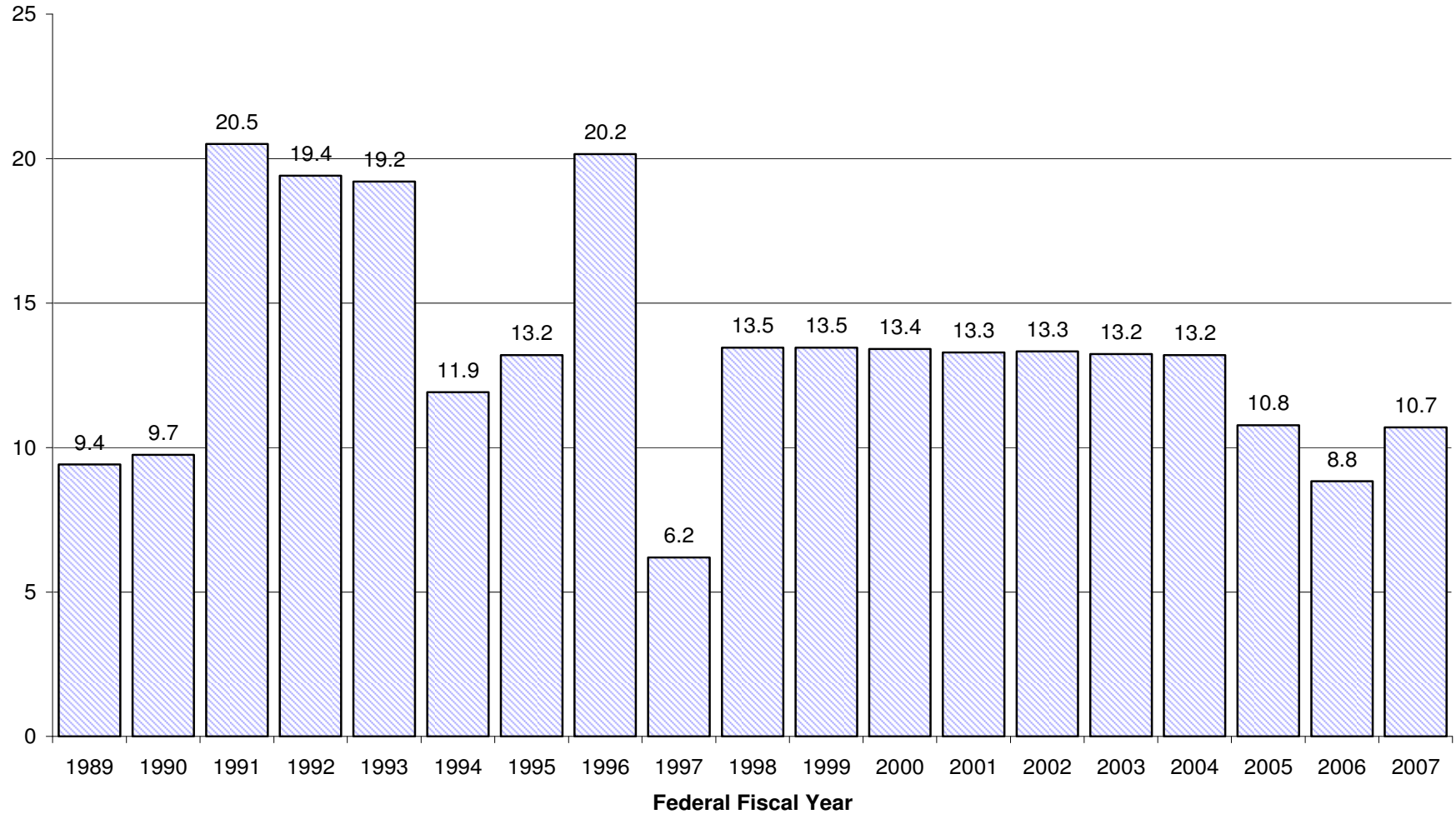


Figure 3

**CLEAN WATER SRF ALLOTMENTS TO NH  
FOR WASTEWATER & LANDFILL CLOSURE PROJECTS  
FEDERAL FISCAL YEARS 1989 THROUGH 2007**



Millions of Dollars





### **Notes for Figure 1**

- a.) The years 1976 and 1977 should essentially be added together and divided by two for each year as there was a change in the timing of federal allotment. This was the peak of federal participation.
- b.) 1973 was the first year of federal grant funding with 1990 being the last.
- c.) During 1989 and 1990, the transition between a federal grant program and the establishment of the revolving loan funding program occurred.
- d.) From the mid 70's to the mid 80's, inflation significantly eroded the purchasing power of this funding and many projects kept getting pushed farther back in time. This caused some communities to not receive any federal money for their major projects.

### **Notes for Figure 2**

See note d.) from Figure 1 above. When EPA funding stopped in 1990, many communities were facing legal action to make them comply with the Clean Water Act but with no fiscal support. At that point, the State of New Hampshire stepped in and funded 95% of the critical projects required to meet compliance goals. This is reflected on the chart for the year 1992. The subsequent years appear to exhibit higher fiscal activity than those prior to 1992 because the State pays an annual stipend to pay off the bonds which funded the projects initially. When the bonds are paid off, then these figures should be reduced accordingly.

### **Notes for Figure 3**

This table represents federal “seed” money funding levels given to NH for the State Revolving Loan Program. As can be seen, levels are trending downward over the last decade. Although this program has been successful, there is not enough loan money available to meet infrastructure needs coming up in the near future. Some of the larger cities facing major projects including separation of combined sewers could easily utilize the entire sum currently available in the program. This would leave none available for the smaller communities.

# **Information Supporting the Summary and Recommendations of the Commission to Study the Publicly Owned Treatment Plants Needs of New Hampshire and State Laboratory Water Tests and Fees**

## **Part A: Wastewater Treatment—the Invisible Infrastructure**

Portions of New Hampshire's infrastructure are very visible. When bridges rust, when concrete fails, when road surfaces deteriorate, the need for upgrading is obvious. Wastewater treatment needs, however, are invisible. Sewers and septic tanks are underground, and treatment plants are typically at the end of a road near a river, as far as possible from residents. Nonetheless, these crucial functions, like other aspects of our infrastructure, need serious attention. They are our first line of defense in protecting public health and our environment. For the reasons developed in this report, the cost of maintaining this defense in New Hampshire will approach one billion dollars over the next ten years.

### **I Overview of Wastewater Treatment**

A multitude of human activities—homes, industries, and businesses-- lead to the production of waste products that enter our community/sewerage or septic systems. In New Hampshire, roughly half of our residents use municipal sewerage and wastewater treatment plants. When the individual septic systems of the other fifty per cent are pumped out, however, the waste products generally enter the treatment plants to be processed and ultimately disposed of.

Treatment plants produce a water effluent whose quality is determined by surface water or groundwater quality requirements and is introduced into receiving streams or into the ground. Solid wastes removed in the process are disposed of in a number of ways.

Three types of treatment have evolved over time:

*Primary treatment* relies on the fact that some solids float and are removed by skimming while other solids (such as human wastes) settle in the form of primary sludge. Usually about 60% of the visible solids are removed and dewatered to allow transport and management. About 35% of the Biochemical Oxygen Demand is also removed.

Biochemical Oxygen Demand, or BOD, is a measure of the quantity of oxygen consumed by microorganisms during the decomposition and stabilization of organic matter.

Imagine a leaf falling into a stream. The leaf, which is composed of organic matter, is readily degraded by a variety of microorganisms inhabiting the stream. Aerobic (oxygen requiring)

bacteria and fungi use oxygen as they break down the components of the leaf into end products such as carbon dioxide, water, phosphate and nitrate. As oxygen is consumed by these biodegrading organisms, the level of dissolved oxygen in the stream begins to decrease.

If the wastewater treatment process did not remove BOD from the wastewater, elevated levels of BOD in the wastewater would be introduced into a stream, lowering the concentration of dissolved oxygen in a receiving water body. There is potential for profound effects on the water body itself, and the resident aquatic life. When the dissolved oxygen concentration falls below 5 milligrams per liter (mg/l), species intolerant of low oxygen levels become stressed. The lower the oxygen concentration, the greater the stress. Eventually, species sensitive to low dissolved oxygen levels are replaced by species that are more tolerant of adverse conditions, significantly reducing the diversity of aquatic life in a given body of water. If dissolved oxygen levels fall below 2 mg/l for more than even a few hours, fish kills can result. At levels below 1 mg/l, anaerobic bacteria (which live in habitats devoid of oxygen) replace the aerobic bacteria. As the anaerobic bacteria break down organic matter, foul smelling hydrogen sulfide can be produced, which can be quite unpleasant and even toxic in high concentrations. The hydrogen sulfide can also form sulphuric acid in both the water and as a vapor.

The final step in primary treatment is use of chlorine to kill pathogens. Chlorine itself can be toxic to aquatic life so a dechlorinating agent must be used later in the process. Chlorine levels in drinking water must be no more than 2 mg/liter and not more than 0.011 mg/liter in the receiving water.

Fortunately, only one of the 85 New Hampshire treatment plants still uses only primary treatment and the US EPA waiver that permitted that use is ending. None of the 27 private facilities or 180 industrial facilities employs only primary treatment.

*Secondary treatment* has been the minimum treatment required by Federal law since 1972. Secondary treatment employs biological processes, typically within tankage, to remove 85% of both visible *and dissolved* solids and 85% of BOD. The bacteria absorb and digest pollutants. Nutrients, which can impair water quality, are only minimally removed. Chlorine in various forms is often used to kill pathogens although some alternatives are presently used. For example, an increasing number of wastewater facilities are utilizing ultraviolet light.

*Tertiary treatment* now referred to as *advanced treatment* is used to meet higher water quality and effluent standards (not attainable through conventional secondary treatment), which are constantly evolving due to the EPA policy changes. Advanced treatment combines biological, physical, and chemical processes which can lead to 90 to 95% removal of BOD and solids. Phosphorous and some forms of nitrogen can be reduced to levels of less than 1.0 mg/liter if the process is adequately designed.

Nitrogen is present in domestic and some industrial wastes. Ammonia, for example, is very toxic to fish, especially when combined with chlorine. It can best be removed biologically, which requires additional tanks, pipes, oxygenation, and pumps. Its toxicity is also related to pH levels of the water, which need to be monitored and controlled by wastewater treatment plants. Effluent pH requirements (for Class B surface waters) are 6.5 to 8.0 units. Drinking water has to

be 6.5 to 8.5 units. Some fish species can tolerate a greater range than this-- from 5.0 to 9.0 units but the best range for them is about what it is for us—6.5 to 8.2 units. Regulation of pH in our waters is complicated by the fact that the pH of typical New Hampshire precipitation is 4.3 units—i.e. acid rain. Low pH can make metals in water more toxic, while higher pH makes nitrogen more toxic. Removal of nitrogen also requires more energy use. There are many sources of nitrogen in addition to treated wastewater, such as non-point sources from runoff or stormwater, but nitrogen levels in our waters have increased, for example, by 59 per cent in Great Bay over the past 25 years. This could lead to significant water quality problems if left unchecked.

Phosphorous in wastewater comes from human solid and liquid waste, fertilizers, pesticides, and cleaning compounds. Normally, phosphorus is not of health significance for humans but can be catastrophic for fresh water systems. Eutrophication caused by phosphorous promotes certain plant and algae growth which reduces dissolved oxygen in the water and leads to the death of many forms of life in rivers, streams, and lakes. In lakes, this can occur if phosphorous is present at greater than 0.025 mg/liter. In rivers and streams, 0.1 mg/liter is the legal limit. It is likely this limit will be changed in the future to 0.01 mg/liter by the US EPA.

Metals such as aluminum and copper are also of concern. Copper in drinking water can be toxic to humans at concentrations exceeding 1,300 ug/l, but is toxic to small aquatic life and fish at only 3 ug/l.

The increasing federal concerns about clean water levels and the need to deal with nitrogen, phosphorous, and metals will lead to the need for further development of advanced treatment systems throughout the state.

It must be noted that every treatment technology produces residual material—sludge—that must be disposed of or reused. Common methods of sludge management include incineration, composting for beneficial use, and disposal in landfills or application as fertilizer. The costs of managing residuals are a significant part of the operating expenses of wastewater treatment plants. In the 2007 legislative session, HB 699 established a commission to study methods and costs of sewage, sludge, and septage disposal. The HB 699 study preliminary report, due by November 1 2007, should be viewed as supplementing this report.

## II. Factors impacting New Hampshire municipal wastewater treatment plant needs

### A. Population growth trends

New Hampshire's population grew by 17.2% from 1990 to 2004 — twice the rate of the rest of New England. Based on the latest U.S. Census Bureau data, the New Hampshire population grew faster than any of the other New England states between July 1, 2000 and July 1, 2005. In fact, New Hampshire is the only state in the region to have grown at a faster rate than the U.S. over that same time period with New Hampshire growing by 5.6 percent, the US growing by 5.0 percent and New England by 2.1 percent. Current New Hampshire population is estimated at 1,320,000 and the New Hampshire Office of Energy and Planning predicts the population will reach over 1,500,000 by 2020. The Society for Protection of New Hampshire Forests predicts

that the state population is expected to grow by more than 28% from 2000 to 2025. An estimated 80% of that growth will occur in the four southeastern counties but all counties except Coos are expected to experience growth.

## B. Current treatment facility capacities

Our state's population growth will obviously affect our needs for wastewater infrastructure expansion. Municipal wastewater treatment plants have been designed and built to meet the estimated needs of the communities they serve. The capacity of New Hampshire wastewater treatment facilities varies greatly ranging from 3,000 to 36,000,000 gallons per day. At present, nearly 25% of New Hampshire's municipal facilities are operating at a level which approaches or exceeds 80% of their design capacity. These facilities will require upgrades in the near future to keep pace with the projected increases in population.

The affected municipalities include:

Allenstown	Berlin
Canaan	Conway Village
Gorham	Grovetown
Hampton	Hillsborough
Hinsdale	Hooksett
Lancaster	Manchester
Nashua	Newmarket
Northumberland	Peterborough
Plymouth	Sunapee
Whitefield	Winchester
Wolfeboro	

In addition, the Portsmouth/Pierce Island facility is under federal orders to improve from primary to at least secondary treatment and *all* facilities must face upgrades, improvements or equipment replacements over time, because of both normal aging and increasing federal requirement to move to advanced treatment levels.

## III New Developments

### A. Evolution of conventional treatment

Substituting non-toxic material for toxins introduced to the wastewater is much more economical than trying to remove it once introduced. Prevention, rather than treatment or recovery, should be a first step.

Conventional secondary treatment, as previously discussed, is intended to meet limitations on effluent total suspended Solids (TSS) (30 mg/L), BOD (30 mg/L) and E. coli bacteria (126 cfu/100 mL). A major problem with conventional treatment is energy cost. Efforts to reduce energy costs have been underway for many years and include advances such as variable

speed drives on pumps, compressors and aeration equipment. Another possibility is on-site power generation using technology such as microturbines, which can be powered by methane gas and/or natural gas. Fairfield, Connecticut has installed such turbines at their wastewater treatment plant. Nashua, NH utilizes methane produced on site by anaerobic digestion to generate electricity.

Many conventional wastewater treatment facilities are adding advanced treatment to comply with more stringent effluent requirements for TSS and BOD as well as requirements to remove NOD (Nitrogenous Oxygen Demand due to ammonia biodegradation); nitrate-N and Total Phosphorus.

During other modifications, many plants are replacing chlorination/dechlorination with UV disinfection to reduce the risk and environmental impacts from production, transport, storage and use of hazardous chemicals.

## B. Advanced Treatment

Emphasis on removal of nitrogen and phosphorous from wastewater has led to many advanced technologies generally grouped into the category of Biological Nutrient Removal (BNR). A common example is the 5-Stage Bardenpho Process, which modifies a traditional wastewater treatment facility to remove nutrients by staggering the degrees of aeration. This creates an ecology of differing organisms which remove the nutrients. Another more commonly retrofit process is called the Modified Ludzack Ettinger (MLE) process which can effectively reduce nitrogen concentrations in wastewater. This technology may make the best use of existing facilities.

Many other biological treatment facilities are considering retrofit or new installations of a variety of technologies including membrane bioreactors (MBR). MBRs are an attractive option when space limitations, stricter effluent requirements or desires for subsequent water reuse exist. Membranes have nanometer size holes that can filter out microbes and even viruses. Epping currently utilizes such technology. The experience gained using this technology at this facility may have statewide significance. Keep in mind that this process, like many other new technologies, is not a panacea as they all exhibit various problems. However, over time, we hope that solutions will evolve making their use more technically and economically feasible.

The efficiency of membrane bioreactors when compared to conventional second stage treatment is remarkable, as shown below.

	Conventional goals	Membrane goals
TSS & BOD	30 mg/liter	1 mg/liter
E. coli bacteria	126 cfu.100 mL	2 cfu/100mL
TKN (nitrogen)	25 mg/liter	3 mg/L
MBAS (detergents)		0.1 mg/L
Virus removal		99.999%

In summary, MBRs may be economical when high quality effluent and/or small footprint is necessary. High quality effluent facilitates reuse rather than discharge, thus augmenting water resources. Knowledge of MBR capabilities and applications is increasing rapidly. Manufacturers are advancing membrane technology to reduce costs and increase performance. Effluent options include:

- Continued disposal of secondary effluents to receiving waters and ocean with much less pollution than from other treatment methods.
- Irrigation of golf courses, landscapes and secondary farmlands (e.g., tree farms etc).
- Indirect reuse via aquifer recharge and storage as well as groundwater recovery (ASR); or coastal water table manipulation to prevent saltwater intrusion;
- Direct reuse via recharging of primary untreated drinking water reservoirs
- Construction of wetlands

Because of their small footprint and possibilities of on-site effluent disposition, MBR may be particularly appropriate for decentralized wastewater treatment, e.g. for cluster developments, malls, or shopping centers. EPA-approved options are becoming more common in the US, although the issues of monitoring and maintenance, even with highly automated systems, are significant.

At the same time, the need for water re-use may be less appropriate for NH than for other areas. Increased cost and public concern about the re-use of treated wastewater are important factors for consideration. While it is possible that increased interest in “sustainability”, commercial demands upon NH’s aquifers, and projected global freshwater shortages may increase pressure to accomplish water reuse in all the New England states, the financial burdens for municipalities remains a key factor.

Despite advances in technology, it seems clear that wastewater technology selection remains site-specific and requires detailed engineering evaluation of alternatives to balance all of the political, economic and technical aspects of a given project so that the optimum technological solution can be chosen for the given site.

#### IV. Costs

The most recent statewide Needs Survey was completed in 2004; another survey will be completed in 2008. The 2004 estimated costs for maintaining and improving the State’s wastewater treatment plants are shown below. Since construction and raw material costs have substantially increased since then, it can be assumed that current costs will be higher and comparable to national estimates. Some of the needs listed in 2004 may have been addressed while new concerns may appear in the 2008 survey. The 2004 costs did not include the EPA mandate to Portsmouth to improve from primary treatment to at least secondary treatment and to remove stormwater and excessive flow from their collection system.

Direct costs for wastewater treatment plants to keep pace with population growth and increasingly strict EPA discharge requirements are estimated at \$200,400,000. It is also important to note that the costs for upgrading wastewater conveyance infrastructure (sewers, pump stations) are also substantial. The 2004 needs survey estimated cost for conveyance upgrades at \$473,300,000. While examination of these activities is beyond the scope of this Commission, the overall financial impact on the state of conveyance and wastewater treatment facilities to meet EPA discharge standards approaches \$673,700,000. Details of the indirect costs are shown below.

Activity	Estimated Cost
Sewer System rehabilitation and new installations	\$140,600,000
Corrections to Combined Sewer Overflow, which convey combined sewage and storm water into the nearest body of water during severe storms	\$261,300,000
Capping of landfills which are conveying polluted water into rivers	\$71,400,000
Total	\$473,300,000

Combined direct and indirect costs approximate \$673,700,000 (2004) upgrades will cost on the order of \$75 per citizen per year over the next decade. NH, with a population of about 1.4 million people, is therefore looking at wastewater infrastructure costs of about \$105 million dollars per year over the next decade.

## V. Conclusions

1. Wastewater treatment facility needs in New Hampshire are significant, costly and growing every year. Current needs for New Hampshire are likely to be on the order of \$1 billion over the next 10 years. This is consistent with national estimates that suggest that the needed wastewater infrastructure (treatment and conveyance systems) upgrades will cost on the order of \$75 per citizen per year over the next decade (about \$225 billion). This growing need is the result of several factors including population growth, more stringent federal environmental regulations on wastewater (not including pending new regulations for storm water) and aging infrastructure.
2. NHDES will undertake an updated wastewater needs survey in 2008. It is expected that there will be a significant increase in the requirement for advanced wastewater treatment, infiltration/inflow correction and major sewer system rehabilitation. This will be necessary because of both population growth and new Federal water quality requirements. The US EPA is quickly moving toward advanced treatment requirements for nitrogen in the Connecticut River Watershed. Nitrogen removal in other rivers which discharge into salt water is another issue, particularly in the Great Bay watershed, where nitrogen levels are increasing steadily. EPA is also moving toward including strict phosphorus limits in many New Hampshire discharge permits when they renew over the next five-year cycle. While some smaller facilities may avoid this requirement in the immediate future, it is likely that



most, if not all, wastewater treatment facilities will have to deal with this issue within the next 5-10 years.

3. For technological, economic and political reasons, solutions to NH wastewater infrastructure needs cannot be solved by one-size fits all approach. Site-specific studies that result in alternative evaluations and recommendations of the optimum solution for a given wastewater facility's needs will be required.
4. The recommended site specific approach does not preclude joint or regional solutions (two or more communities joining together to resolve their wastewater issues) but these regional approaches are likely to only be successful if the communities interested in a regional wastewater solution initiate the process (a grassroots or bottom up strategy) and refine it to meet their specific needs.
5. Funding the growing needs in wastewater infrastructure poses a difficult problem for NH and its communities. With a population of about 1.4 million people, based on national trends NH is looking at wastewater infrastructure costs of about \$105 million dollars per year over the next decade. The current approach of using Federally backed state revolving loan funds, State supported grants and local/user fees is not a workable model at the current funding levels. Current Federal and State funding of approximately \$22 million dollars per year suggest that the wastewater infrastructure needs will NEVER be met until funding levels are changed. The need to increase federal funding, state funding and user fees is obvious. However, given the magnitude of the problem (a deficit of about \$850 million dollars for NH) it becomes clear that a major federal initiative is needed.
6. The vast majority of our wastewater infrastructure was built during the 1970's and 1980's when the Federal Water Pollution Control Act (Clean Water Act) established the construction grants program. Through construction grants the Federal government supplied 75% of the funds needed, the State provided 20% of the funds needed and the Local community provided the remaining 5% of the funds. That federally funded wastewater infrastructure is now approaching 30 years old and was designed in most cases for a 25 year economic life. Clearly, the time has come to reinstate the Federal Construction Grants Program for wastewater infrastructure needs in order to improve the environment, protect public health, stimulate research and industry and create jobs.
7. The state should also encourage increased and adequate funding by local entities in order to properly maintain their wastewater infrastructure including collection, treatment and disposal systems. Many communities do not adequately charge user fees needed to properly keep up with operation and maintenance, let alone capital funds for major upgrades or equipment replacement which is inevitable. Additional staffing at the State level would be needed to provide outreach, education and assistance to those communities facing capacity and expansion issues. Care must be taken to assure that small communities be assured access to State Revolving Loan Funds and that the larger cities do not use up all of the money available. It should be noted here that in spite of funding levels, the overwhelming majority of wastewater staff at these facilities perform an exemplary job maintaining what they have

in order to stay in compliance with water quality goals and permit limits. They deserve thanks and recognition for the work they do 24/7 to protect public health and the environment. We must also be aware of the future need for trained wastewater professionals, as the majority of this work force will be retiring in the next 5-10 years.

8. Realistically, however, the use of local or user fees can only go so far in meeting the cost of wastewater infrastructure needs, since approval of these fees becomes increasingly more difficult as the costs for other local needs from schools to public safety to road maintenance also continue to increase. Further, there reaches a point where user fees become too large and act as an impediment to local economic growth. Clearly, the time has come to reinstate at some level the Federal Construction Grants Program. It is imperative that the NH Legislature and Executive work with its US Congressional delegation to make this need known.
9. It should be noted that wastewater treatment plants are by no means the only threat to water quality. The Legislative and Executive branches should pay increased attention to non-point source pollution that comes from urban streets, storm water runoff, construction sites, and agricultural practices (i.e., chemical fertilizer and pesticide use). Recent water quality studies appear to indicate that this could be even more of a significant pollution source than wastewater facility discharges. As well as possible legislation, public education on best management practices relating to agriculture, construction, street cleaning and household waste management would be useful. Again, outreach programs to do this would entail a cost.
10. Another important cost in wastewater treatment, which has not been dealt with in this report, is the handling of septage and residuals from treatment (sludge). The Sewage, Sludge, and Septage Disposal Commission was established by the 2007 legislature. The commission is charged to file an interim report on its findings and any recommendations for proposed legislation to the speaker of the house of representatives, the president of the senate, the house clerk, the senate clerk, the governor, and the state library on or before November 1, 2007, and shall make a final report on its findings and any recommendations for proposed legislation to the same parties on or before November 1, 2008. The results of that study commission should be considered when the state and municipalities are considering the future direction of wastewater treatment plant development.

## **Part B: State Laboratory Water Tests and Fees**

The Laboratory Services Unit of The Department of Environmental Services, located at the Health and Human Services Building at 29 Hazen Drive, includes a staff of 23. An addition to the laboratory was made in 2004, and the laboratory was renovated in 2005. It is accredited by the National Environmental Laboratory Accreditation Conference, and certified by the EPA and FDA. The DES Laboratory is the primacy laboratory in New Hampshire in support of the federal Safe Drinking Water Act. In fiscal year 2006, 95,921 tests were performed on 33,830 samples. In addition to testing, the laboratory supports all DES programs and the Department's strategic goals including Homeland Security, health related programs, the public, research projects such as studies on MTBE and arsenic, and other state and federal projects.

The recent history of legislative studies of the laboratory is fairly large. In 2003, HB1411 was introduced, relative to funding state laboratories. In 2004, it was amended in the Senate to establish a study committee relative to laboratory fees and services; the bill failed to pass. In the 2004-2005 session, HB 135-FN-A established a committee to study funding sources for the state laboratories. This study was completed in October of 2005, and its recommendations continue to be relevant. HB669 FN was introduced in 2005, and was amended to establish a committee to study state laboratory water tests and fees. This bill was tabled by the Senate, but was added as an amendment to HB1491.

HB 1491, originally a commission to study the publicly owned treatment plant needs of the state of New Hampshire, was expanded so that "The commission shall study water tests conducted by the state laboratory of hygiene and water test fees collected by the department of environmental services. The commission shall evaluate the need for future additions to existing laboratory tests and equipment and make recommendations for laboratory test fees and distributions to the laboratory equipment and replacement fund."

Since the passage of HB 1491, water test fees have been revised and the revised fees were included in HB2 in 2007. The Department of Environmental Services is satisfied with this set of fees at present. The Department is, however, engaged in developing an improved methodology for calculating the actual cost per test. This study will not be completed prior to the Commissions report date of November 30, 2007. It is recommended that, upon the completion of the study, the Department should propose future legislation to amend RSA 131:3-a to either update the schedules of test offerings and fees or amend the current statute to grant the Department the authority to make future changes through the rule making process. Further, whenever changes to fee schedules do occur, the Department should allow a sufficient period of time before they take effect, for public water systems to plan for the additional expenditures in their budgets. The commission also recommends that the Department, in keeping with its public policy goal of encouraging homeowners to test their wells regularly, should continue to offer such tests at an affordable cost to the homeowner.

In the light of developments within the Legislature (HB2 of 2007) and the Department, it seems appropriate that the Department of Environmental Services continue their present study and operations without the need for further involvement by this commission.

## **Acknowledgements**

I would like to thank the Commission members for their hard work in examining this important issue. In particular, I would like to acknowledge the contributions of George Neill and Patricia Bickford of the NH Department of Environmental Services, Prof. Jim Malley of UNH, Mario Leclerc of the City of Nashua, Philip Bilodeau of the City of Concord, Jack Ruderman, Deputy Director of the Office of Energy and Planning, Representatives Tom Fargo and Andy Peterson, and Senator Jackie Cilley.

For the Commission,

Representative James F. Powers, Chair  
November 7, 2007